Oxford Quadrangle, Maine

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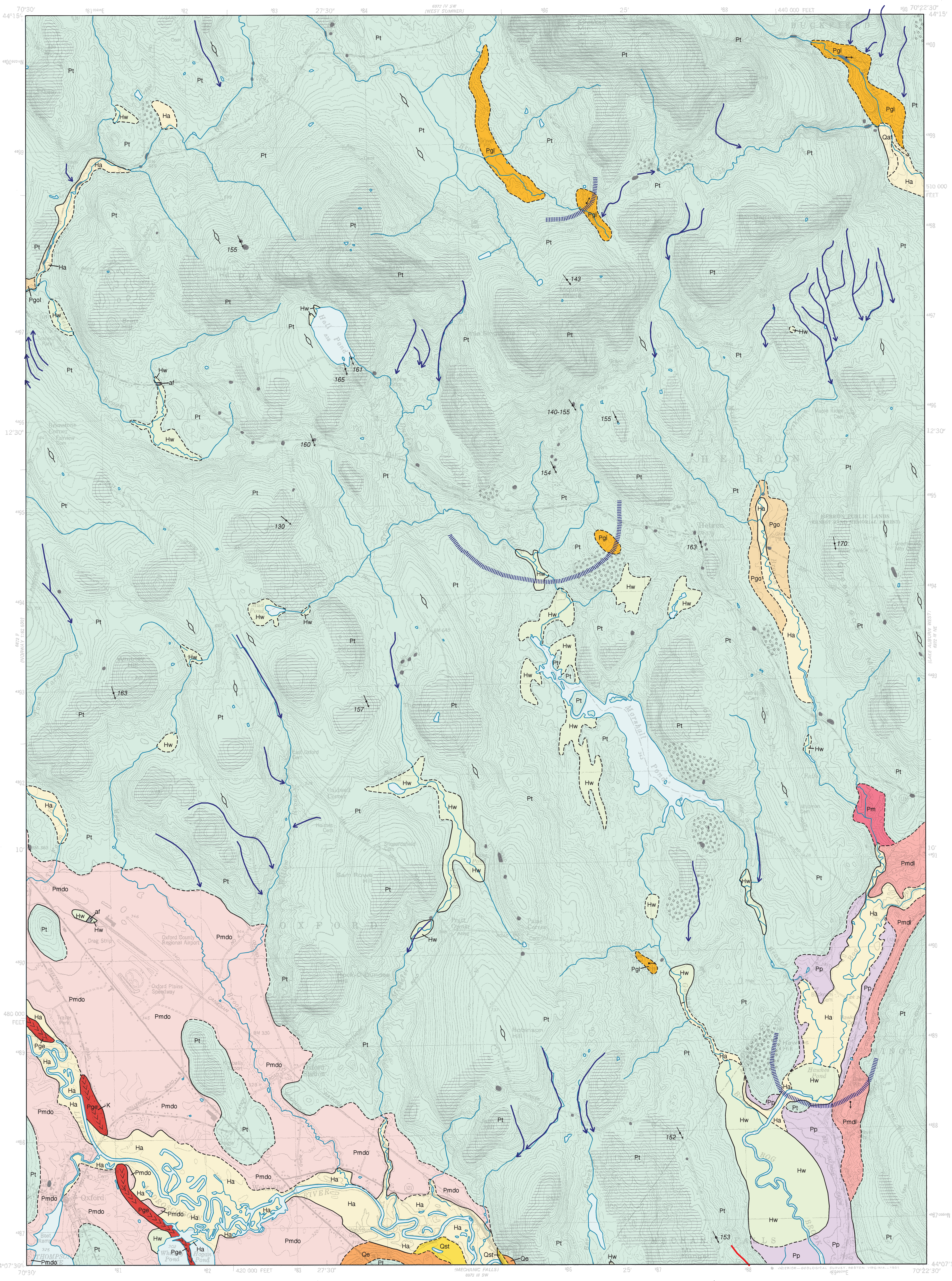
Surficial Geology



SOURCES OF INFORMATION

Surficial geologic mapping by Woodrow B. Thompson completed during the 2000 field season; funding for this work provided by the U.S. Geological Survey STATEMAP program and the Maine Geological Survey, Department of Conservation.

Quadrangle Location

SCALE 1 : 24,000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET

TRUE NORTH

Topographic base from U.S. Geological Survey Oxford quadrangle, scale 1:24,000 using standard U.S. Geological Survey topographic map symbols.

The use of industry, firm, or local government names on this map is for location purposes only and does not impute responsibility for any present or potential effects on the natural resources.

Ha	**Stream alluvium** - Sand, gravel, silt, and organic sediment. Deposited on flood plains of modern streams. Unit may include some wetland areas.
Hw	**Wetland deposits** - Peat, muck, silt, and clay. Deposited in poorly drained areas.
Qaf	**Alluvial fan deposits** - Stream gravel in the Bicknell Brook valley.
Qst	**Stream terrace** - Former flood plain resulting from erosion and downcutting by the Little Androscoggin River.
Qe	**Eolian deposits** - Windblown sand. Forms dunes and blanket deposits in the Little Androscoggin River valley.
Pgo	**Outwash deposits** - Sand and gravel deposited by glacial meltwater streams in the Middle Branch valley.
Pgol	**Little Androscoggin River outwash** - Sand and gravel deposited by glacial meltwater.
Pp	**Presumpscot Formation** - Glaciomarine silt, clay, and sand deposited on the sea floor in late-glacial time.
Pm	**Glaciomarine sediments, undifferentiated** - Sand, gravel, and clay-silt deposited in the late-glacial sea. May include deposits formed in a variety of marine environments and locally modified by postglacial erosion.
Pmdi	**Glaciomarine ice-contact delta** - Sand and gravel deposited into the sea. Formed in contact with receding glacial ice in the Bog Brook valley.
Pmdo	**Glaciomarine outwash delta** - Sand and gravel deposited into the sea in the Little Androscoggin River valley. Locally underlain by glaciomarine silt and clay (Presumpscot Formation).
Pge	**Esker deposits** - Sand and gravel deposited by glacial meltwater streams in tunnels beneath the ice.
Pgi	**Ice-contact deposits** - Miscellaneous sand and gravel deposits formed adjacent to glacial ice. Specific mode of deposition is unknown.
Pt	**Till** - Loose to very compact, poorly sorted, massive to weakly stratified mixture of sand, silt, and gravel-size rock debris deposited by glacial ice. Locally includes lenses of waterlaid sand and gravel.

Bedrock outcrops / thin drift areas - Ruled pattern indicates areas where outcrops are common and/or surficial sediments are generally less than 10 ft thick (mapped partly from air photos). Dots show individual outcrops.

af **Artificial fill** - Earth, rock, and/or man-made fill along roads and railroads, and in landfills.

Contact - Boundary between map units. Dashed where very approximate.

Ice-margin position - Line shows approximate position of the glacier margin during ice retreat, based on positions of meltwater channels, boulder concentrations, nearby moraine ridges, and/or ice-contact sand and gravel deposits.

Moraine ridge - Line shows crest of moraine ridge deposited at glacier margin.

Glacially streamlined hill - Symbol shows trend of long axis, which is parallel to former glacial ice-flow direction.

135 **Glacial striation locality** - Arrow shows ice-flow direction inferred from striations on bedrock. Dot marks point of observation. Number is azimuth (in degrees) of flow direction. Flagged trend is older.

Dip of cross-bedding - Arrow shows average dip direction of cross-bedding in fluvial or deltaic deposits, which indicates direction of stream flow or delta progradation. Point of observation at tip of arrow.

Meltwater channel - Channel eroded by glacial meltwater stream. Arrow shows inferred direction of former stream flow.

>>>>> **Crest of esker** - Shows trend of esker ridge. Chevrons point in direction of meltwater flow.

Area of many large boulders, where observed - May be more extensive than shown.

K **Kettle** - Depression created by melting of buried glacial ice and collapse of overlying sediments. Often occupied by ponds (e.g. kettle ponds).

USES OF SURFICIAL GEOLOGY MAPS

A surficial geology map shows all the loose materials such as till (commonly called hardpan), sand and gravel, or clay, which overlie solid ledge (bedrock). Bedrock outcrops and areas of abundant bedrock outcrops are shown on the map, but varieties of the bedrock are not distinguished (refer to bedrock geology map). Most of the surficial materials are deposits formed by glacial and deglacial processes during the last stage of continental glaciation, which began about 25,000 years ago. The remainder of the surficial deposits are the products of postglacial geologic processes, such as river floodplains, or are attributed to human activity, such as fill or other land-modifying features.

The map shows the areal distribution of the different types of glacial features, deposits, and landforms as described in the map explanation. Features such as striations and moraines can be used to reconstruct the movement and position of the glacier and its margin, especially as the ice sheet melted. Other ancient features include shorelines and deposits of glacial lakes or the glacial sea, now long gone from the state. This glacial geologic history of the quadrangle is useful to the larger understanding of past earth climate, and how our region of the world underwent recent geologically significant climatic and environmental changes. We may then be able to use this knowledge in anticipation of future similar changes for long-term planning efforts, such as coastal development or waste disposal.

Surficial geology maps are often best used in conjunction with related maps such as surficial materials maps or significant sand and gravel aquifer maps for anyone wanting to know what lies beneath the land surface. For example, these maps may aid in the search for water supplies, or economically important deposits such as sand and gravel for aggregate or clay for bricks or pottery. Environmental issues such as the location of a suitable landfill site or the possible spread of contaminants are directly related to surficial geology. Construction projects such as locating new roads, excavating foundations, or siting new homes may be better planned with a good knowledge of the surficial geology of the site. Refer to the list of related publications below.

OTHER SOURCES OF INFORMATION

1. Thompson, W. B., 2001, Surficial geology of the Oxford 7.5' quadrangle, Oxford and Androscoggin Counties, Maine: Maine Geological Survey, Open-File Report 01-394, 8 p.
2. Locke, D. B., and Thompson, W. B., 1998, Surficial materials of the Oxford quadrangle, Maine: Maine Geological Survey, Open-File Map 98-249.
3. Neil, C. D., 1998, Significant sand and gravel aquifers of the Oxford quadrangle, Maine: Maine Geological Survey, Open-File Map 98-216.
4. Thompson, W. B., 1979, Surficial geology handbook for coastal Maine: Maine Geological Survey, 68 p. (out of print).
5. Thompson, W. B., and Borns, H. W., Jr., 1985, Surficial geologic map of Maine: Maine Geological Survey, scale 1:500,000.
6. Thompson, W. B., Crossen, K. J., Borns, H. W., Jr., and Andersen, B. G., 1989, Glaciomarine deltas of Maine and their relation to late Pleistocene-Holocene crustal movements, *in* Anderson, W. A., and Borns, H. W., Jr. (eds.), Neotectonics of Maine: Maine Geological Survey, Bulletin 40, p. 43-67.